

Rubiacearum Americanarum Magna Hama Pars XIV. New Species
of *Malanea* (Guettardeae) from Western South America

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ABSTRACT. The new species *Malanea campylocarpa* from the western Amazon basin, *M. cylindrica* from east-central Peru, and *M. ecuadorensis* from east-central Ecuador are described and illustrated here. These are all notable for their cylindrical fruits, and all have previously been confused with *M. boliviana* Standley. A key to *Malanea* in western South America includes eight species.

Key words: Guettardeae, *Malanea*, Rubiaceae, South America.

The Neotropical genus *Malanea* Aublet (Guettardeae; Robbrecht, 1993) comprises about 35 species of lianas, woody vines, and shrubs found in moist and wet vegetation from southeastern Nicaragua to eastern Brazil and northern Bolivia. The genus has not been reviewed as a whole, and in general has been rather poorly studied. The majority of its species are found in northeastern South America, most of them in the Guayana region. Steyermark (1965) reported 25 species, though several of these were based on only one or two specimens and distinguished only by the density and distribution of their pubescence; they deserve reevaluation when more specimens are available.

Malanea is distinguished by the combination of its usually climbing habit; its leaves with lineolate venation; its interpetiolar, generally caducous stipules; its axillary inflorescences; its corollas with the tubes relatively short and the lobes valvate in bud; and its fleshy fruits each with a single hard pyrene. This distinctive lineolate venation pattern has the tertiary veins closely parallel, though these veins and thus this feature are not readily visible in many species of *Malanea*. Such lineolate venation is found in many species of the Guettardeae as well as several other Rubiaceae tribes (e.g., *Hippotis* Ruiz & Pavón, Hippotidae; *Sommeria* Schlechtendal, Hippotidae; *Joosia* H. Karsten, Cinchoneae). The vining or liana habit of many species of *Malanea* is relatively uncommon among Neotropical Rubiaceae. However, it is found in a few species of other genera belonging to both the Guettardeae (e.g., *Chomelia stergiosii* Steyermark, *C. volubilis*

(Standley) Steyermark) and other tribes (e.g., *Uncaria guianensis* (Aublet) J. F. Gmelin, Naucleaeae; *Randia altiscandens* (Ducke) C. M. Taylor, Gardenieae). The delimitation of the Neotropical genera of Guettardeae is largely traditional and probably deserves reevaluation, in particular the recognition of *Malanea* based primarily on its climbing habit.

The flowers of *Malanea* are generally pale green to white, yellow, or orange, and thus probably insect-pollinated. The corollas are usually densely pubescent in the tube and throat, and often this pubescence extends onto the corolla lobes. The species of *Malanea* that have been studied have homostylous flowers, although flowers are known for only a few species so the occurrence of distyly in this genus cannot yet be excluded. Distyly is present in some species of the related genera *Chomelia* Jacquin and *Guettarda* L. The succulent fleshy fruits of *Malanea* are presumed to be dispersed by animals.

The species described below were discovered during preparation of the Rubiaceae treatment for the *Flora of the Venezuelan Guayana*. A key is presented here to all the *Malanea* species known from western South America, in this case comprising Bolivia, Peru, Ecuador, and Colombia.

KEY TO THE SPECIES OF *MALANEA* IN WESTERN SOUTH AMERICA

1. Inflorescences spiciform, unbranched or with 1 to 2 pairs of secondary axes, with the flowers borne in sessile glomerules along the primary and secondary axes; dried fruits cylindrical, similar in diameter throughout; pyrenes 1-locular.
2. Plants hirsute throughout, the trichomes long and spreading; bracts 3–12 mm long
. *M. ecuadorensis* C. M. Taylor
- 2'. Plants strigose to strigillose throughout, the trichomes appressed; bracts 1–3.5 mm long.
3. Fruits strongly curved; leaves 9–20 × 4–10 cm; corolla pale green, with the tube ca. 2 mm long
. *M. campylocarpa* C. M. Taylor
- 3'. Fruits straight or slightly curved; leaves 4.5–13 × 2–7.5 cm; corolla yellow-orange, with the tube ca. 4 mm long
. *M. cylindrica* C. M. Taylor

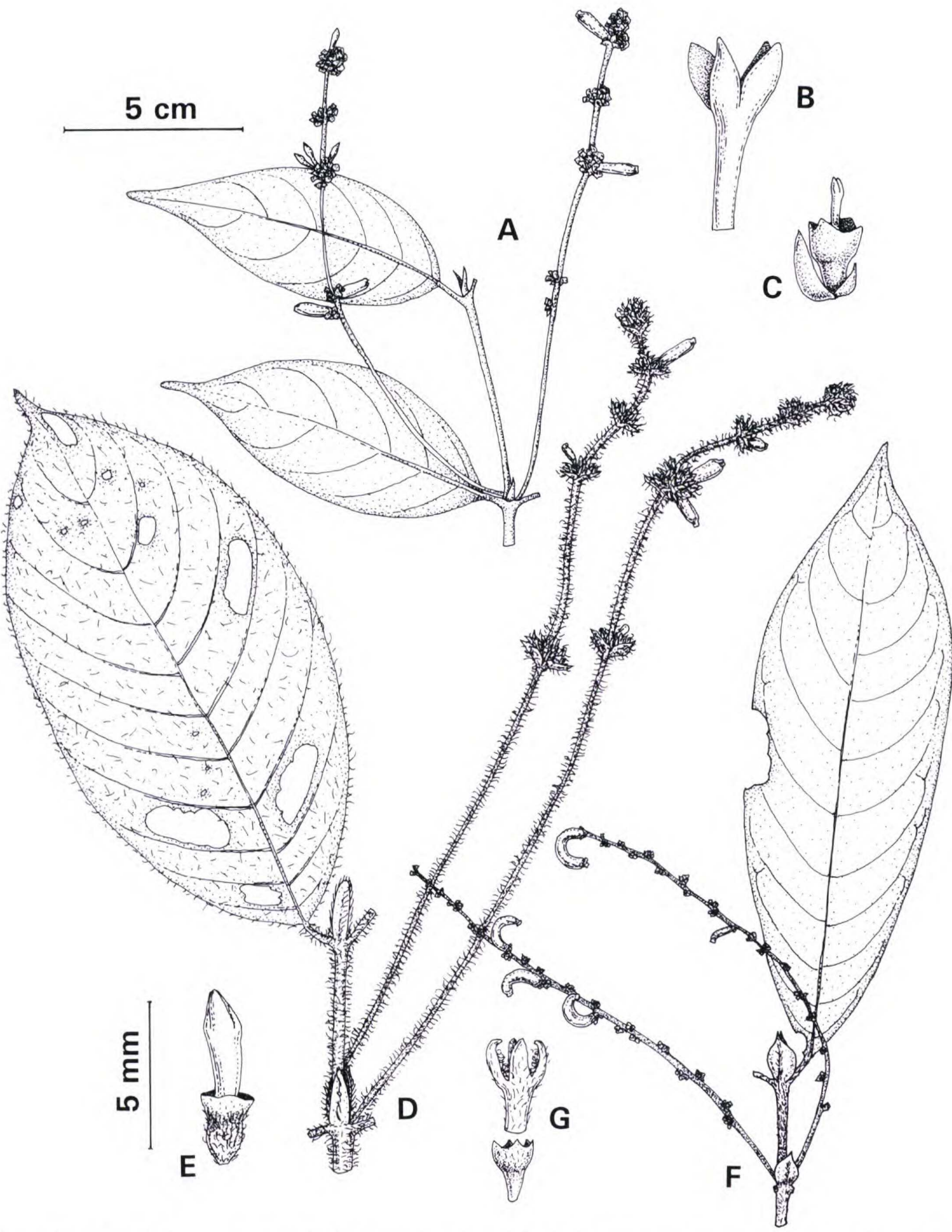


Figure 1. A–C, *Malanea cylindrica* C. M. Taylor; based on Schunke V. 7696. —A. Stem with leaves and two inflorescences with developing fruits. —B. Corolla. —C. Detail of flower showing calyx limb, hypanthium, style, stigmas, and two floral bracts. D, E, *Malanea ecuadorensis* C. M. Taylor. —D. Stem with leaf and two infructescences; based on Coello 19. —E. Flower bud; based on Cerón 3922. F, G, *Malanea campylocarpa* C. M. Taylor. —F. Stem with leaf and two infructescences; based on Neill 8938. —G. Flower, partially dissected; based on Cerón 6030. A, D, F to 5-cm scale; B, C, E, G to 5-mm scale.

- 1'. Inflorescences thyriform-paniculate, with 1 to several pairs of developed secondary axes, with the flowers borne in sessile glomerules or cymules along the primary, secondary, and tertiary axes; dried fruits ellipsoid to fusiform, widest in the middle; pyrenes 2-locular.
- 4. Leaves on abaxial surface densely sericeous to velutinous, the lamina surface not visible, covered by silvery gray pubescence
. *M. macrophylla* Bartling ex Grisebach
- 4'. Leaves on abaxial surface sparsely strigillose to rather densely hirtellous, the lamina surface visible and the pubescence not noticeably silvery gray.
- 5. Leaves at apex obtuse to rounded and sometimes shortly cuspidate, abaxially with pubescence spreading.
- 6. Leaves with margins plane; stipules obtuse to rounded; fruits 4–5 mm long; Pacific coastal Colombia
. *M. chocoana* Standley ex Steyermark
- 6'. Leaves with margins plane or frequently revolute; stipules obtuse to acute or acuminate; fruits 6–8 mm long; Amazon basin of Peru
. *M. sarmentosa* Aublet
- 5'. Leaves at apex acute to acuminate or cuspidate, abaxially with pubescence appressed.
- 7. Inflorescences with the axes unbranched and spiciform, the flowers borne in glomerules; calyx limb 1.2–1.5 mm long; Amazon basin of Ecuador, Peru, and Bolivia
. *M. boliviana* Standley
- 7'. Inflorescences with the axes branched and thyriform-paniculate, the flowers borne in branched cymules; calyx limb 0.5–1 mm long; Pacific coastal Colombia and northwestern Ecuador . . . *M. erecta* Seemann

Malanea campylocarpa C. M. Taylor, sp. nov.
TYPE: Ecuador. Napo: Canton Tena, Estación Biológica Jatun Sacha, Río Napo, 8 km al E de Misahuallí, 1°04'S, 77°36'W, 400 m, 14 Apr. 1991, W. Palacios 7068 (holotype, QCNE; isotype, MO-5568801). Figure 1F, G.

Haec species a congeneris foliis satis grandibus, inflorescentia spiciformi satis longa atque fructu cylindrico valde arcuato distinguitur.

Lianas or perhaps epiphytic shrubs, height unknown; stems densely strigose. Leaves elliptic to narrowly so or obovate, 9–20 × 4–10 cm, at apex acute to acuminate with tips 1–1.5 cm long, at base cuneate to obtuse or shortly rounded, drying chartaceous, adaxially glabrous or strigillose along costa, abaxially strigillose on veins with trichomes regularly ordered along and perpendicular to tertiary veins; secondary veins 8 to 11 pairs, not or weakly looping to interconnect near margins, without domatia, adaxially costa plane to prominulous, second-

ary veins plane to impressed, and remaining venation plane, abaxially costa prominent, secondary veins prominulous, and remaining venation plane to thickened; petioles 6–12 mm long; stipules caducous, elliptic to obovate, 10–16 mm long, obtuse to acute, abaxially glabrous or usually strigillose near base and along medial line. Inflorescences densely strigillose, spiciform, often flexuose, unbranched or infrequently with 1 to 2 pairs of spiciform secondary axes; peduncles 2–6 cm long; flower-bearing portion 7–18 × 1–1.5 cm, with flowers in 8 to 30 glomerules of 5 to 15; bracts 1–3.5 mm long, linear to narrowly triangular, acute; flowers sessile; hypanthium cylindrical, 1.5–2 mm long, glabrous; calyx limb ca. 1.2 mm long, sparsely strigillose, lobed for 1/4–1/3, lobes obtuse to acute; corolla salverform, pale green, externally moderately to densely strigillose, internally densely hirtellous throughout tube and on lobes, tube ca. 2 mm long, lobes narrowly ligulate, ca. 2 mm long, acute; anthers ca. 1 mm long, exserted; style and stigmas not seen. Fruits cylindrical, strongly curved, ca. 12 × 3 mm, glabrous, blue-black; pyrene 1, smooth, 1-locular.

Distribution, habitat, and phenology. In wet forests on the eastern slopes of the Andes, at ca. 260 m in central Peru, at 400–480 m in Ecuador, and to 1420 m in southwestern Colombia; collected in flower in January, in fruit in January, March, and April.

Malanea campylocarpa is distinguished by its relatively large leaves, relatively long spiciform inflorescences, and cylindrical, strongly curved fruits with the pyrene apparently 1-locular. The strongly curved fruits are distinctive; the species epithet refers to this character. Only one flowering collection has been seen, so it cannot be determined if this species is distylous. The distinctions between this and similar *Malanea* species found in the western Amazon basin are discussed under the description of *M. cylindrica*, below.

Paratypes. COLOMBIA. **Putumayo:** mpio. Mocoa, correg. San Antonio, vereda Alta Campucana, Finca La Mariposa, 1350–1420 m, J. L. Fernández et al. 10844 (COL, MO). ECUADOR. **Napo:** Canton Archidona, riberas del Río Alpayacu, Helipuerto 6, Compañía Triton, H. Vargas & Grefa 865 (MO); Canton Tena, Estación Biológica Jatun Sacha, Río Napo, 8 km al E de Misahuallí, C. Cerón 6030 (MO), C. Cerón 6037 (MO), C. Cerón 6317 (MO), Gentry et al. 60033 (MO), Neill 7057 (MO), Neill 8938 (MO). PERU. **Huánuco:** prov. Pachitea, Dantas, trochas de estudio UNA La Molina, Km 42, carretera marginal, C. Díaz S. & Baldeón 2305 (MO). **Madre de Dios:** prov. Tambopata, ca. 30 air km or 70–80 river km SSW Puerto Maldonado at affluence [sic; confluence] of Río La

Torre (Río D'Orbigny)/Río Tambopata (SE bank), Tambopata Nature Preserve, *P. J. Barbour 4849* (MO).

Malanea cylindrica C. M. Taylor, sp. nov. TYPE: Peru. San Martín: prov. Mariscal Cáceres, dtto. Tocache Nuevo, Fundo Miramar al N de Tocache, margen izquierda del Río Huallaga, 450 m, 23 July 1974, *J. Schunke Vigo 7696* (holotype, MO-2736920). Figure 1A–C.

Haec species a *Malanea boliviana* inflorescentia spiciformi simplici, calycis limbo 1.2–1.5 mm longo, corollae tubo ca. 4 mm longo ac lobulis ca. 2 mm longis atque fructu cylindrico 10–11 × ca. 3.5 mm distinguitur.

Lianas or perhaps hemi-epiphytes, height not recorded; stems densely strigose. *Leaves* elliptic to broadly so or lanceolate, 4.5–13 × 2–7.5 cm, at apex acute to usually acuminate with tips 5–15 mm long, at base obtuse to rounded, drying chartaceous to subcoriaceous, adaxially glabrous, abaxially moderately strigillose to strigose with pubescence often denser on principal veins; secondary veins 5 to 6 pairs, extending to margins, without domatia, adaxially venation plane or costa prominulous, abaxially costa prominent, secondary veins prominulous, and remaining venation plane; petioles 4–7 mm long; *stipules* caducous, triangular, 4–10 mm long, acute to usually acuminate, abaxially moderately to densely strigillose especially along medial line, to glabrescent near margins. *Inflorescences* densely strigillose to hirtellous, spiciform, unbranched; peduncles 3–5 cm long; flower-bearing portion 3–9.5 × 1–1.5 cm, with flowers in 2 to 6 sessile glomerules of 3 to 15; bracts deltoid to narrowly triangular, 1–3 mm long, acute; *flowers* sessile; hypanthium turbinate, ca. 1 mm long, glabrous; *calyx* limb 1.2–1.5 mm long, glabrous, sinuate to shallowly lobed, lobes obtuse; *corolla* salverform, yellow-orange, externally and internally glabrous, tube ca. 4 mm long, lobes lanceolate, ca. 2 mm long; *anthers* ca. 1.5 mm long, situated in corolla throat; *stigmas* ca. 0.2 mm long, situated below corolla throat. *Fruits* cylindrical, ca. 10–11 × 3.5 mm, glabrous, dark red, with persistent calyx limb to 2 mm long; pyrene 1, smooth, 1-locular.

Habitat, distribution, and phenology. In wet forests at 400–700 m on Amazonian slopes of central Peru; collected in flower in July, in fruit in July and August.

This new species is similar to and probably sympatric with *Malanea boliviana* Standley. However, it is distinguished by its spiciform, unbranched inflorescences, calyx limbs 1.2–1.5 mm long, corollas with the tube ca. 4 mm long and lobes ca. 2 mm long, and cylindrical fruits 10–11 × 3.5 mm versus

inflorescences with at least one pair of developed secondary axes, calyx limbs ca. 0.8 mm long, corollas with the tube ca. 1.5 mm long and lobes ca. 1.5 mm long, and fusiform to ellipsoid fruits ca. 7 × 4.5 mm in *M. boliviana*.

The cylindrical fruits are unusual in *Malanea*, most species of which have ellipsoid to fusiform fruits; the specific epithet refers to this character. Cylindrical fruits are also found in two other species of western South America that are both described in this article. *Malanea campylocarpa* differs from *M. cylindrica* in its relatively larger leaves, 9–20 × 4–10 cm, and its pale green corollas with the tube ca. 2 mm long, and from both these other species in its strongly curved fruits. *Malanea ecuadorensis*, too, differs from *M. cylindrica* in its relatively larger leaves, 11–22 × 4–12 cm, and from both these other species in its hirsute pubescence, longer inflorescences with the peduncles 2.5–15 cm long and the flower-bearing portion 2.5–12 cm long, and longer bracts, 3–12 mm long.

The internally glabrous corollas of this species are also unusual in *Malanea*. Only one collection with mature flowers has been seen, so whether this species is distylous cannot be determined.

Paratypes. PERU. **San Martín:** prov. Mariscal Cáceres, dtto. Tocache Nuevo, Quebrada de Santa Rosa de Cachiyacu (carretera a Progreso), *J. Schunke V. 7588* (MO); Quebrada de Huaquisha, margen derecha del Río Huallaga, *J. Schunke V. 8055* (MO).

Malanea ecuadorensis C. M. Taylor, sp. nov. TYPE: Ecuador. Napo [Orellana]: Yasuní Forest Reserve, 1–3 km E of Pontificia Universidad Católica del Ecuador Science Station, by Tiputini River, 00°41'S, 76°24'W, 240 m, 15 June 1995, *P. Acevedo-Rodríguez & J. A. Cedeno 7327* (holotype, MO-5568802; isotype, US). Figure 1D, E.

Haec species a congeneris pubescentia hirsuta, foliis satis grandibus, inflorescentia spiciformi atque fructu cylindrico recto vel leniter curvato distinguitur.

Lianas or apparently sometimes small shrubs, to 8 m high; stems moderately to densely hirsute. *Leaves* elliptic to elliptic-oblong, 11–22 × 4–12 cm, at apex acuminate with tips 0.5–1 cm long, at base cuneate to usually obtuse or rounded, drying papyraceous, on both surfaces sparsely to moderately hirsute with pubescence denser on costa and secondary veins, often also strigose on principal veins abaxially; secondary veins 9 to 10 pairs, not or weakly looping to interconnect near margins, without domatia, adaxially costa and secondary veins thinly prominulous and remaining venation

plane, abaxially costa prominent, secondary veins prominulous, and remaining venation plane to thickened; petioles 7–20 mm long; *stipules* caducous after 1 to 2 distalmost nodes, narrowly ligulate to triangular, 15–20 mm long, obtuse to usually acute, abaxially glabrous except sparsely to moderately hirsute and strigillose along a medial line, ciliate on margins. *Inflorescences* densely hirsute, spiciform, unbranched, flexuose; peduncles 2.5–15 cm long; flower-bearing portion 2.5–12 × 1–2 cm, with flowers borne in 3 to 8 sessile glomerules of 5 to 15; bracts 3–12 mm long, ovate to lanceolate, acute to somewhat acuminate; *flowers* sessile; hypanthium ellipsoid, ca. 1.5 mm long, hirtellous; *calyx* limb 1–1.2 mm long, glabrous to sparsely hirtellous, truncate to lobed for up to 1/2, lobes ligulate, rounded; *corolla* in bud slenderly funnel-form, yellow, externally glabrous, internally not seen, tube to 3 mm long, lobes to 1.2 mm long; *anthers*, *style*, and *stigmas* not seen. *Fruits* cylindrical, 11–12 × 3–4 mm, straight to slightly curved, glabrous except hirtellous on calyx lobes, purple to red; pyrene 1, smooth, 1-locular.

Distribution, habitat, and phenology. In wet forest on terra firme (i.e., land not inundated when rivers rise) at 200–300 m, northeastern Ecuador; collected in flower bud in April and June, in fruit in May and June.

This new species is distinguished by the combination of its hirsute pubescence, relatively large leaves, spiciform inflorescences, and straight to slightly curved cylindrical fruits. *Malanea ecuadorensis* is known only from the type region in Ecuador; the epithet refers to this range. The distinctions between this and other *Malanea* species from the western Amazon basin are discussed un-

der the description of *M. cylindrica*, above. This new species is also similar in its hirsute pubescence to *Malanea ursina* Standley, which is known from the central Amazon basin; *M. ursina* differs from this new species in its generally smaller leaves, 5–8.5 × 2–4.5 cm, with usually 6 pairs of secondary veins; its smaller stipules, ca. 7 mm long; its smaller inflorescences, with peduncles ca. 1.5 cm and the flower-bearing portion ca. 4 × 1 cm; and its shorter calyx limbs, ca. 0.8 mm long. No mature flowers of *M. ecuadorensis* have yet been seen.

Paratypes. ECUADOR. **Napo [Orellana]:** Parque Nacional Yasuní, pozo petrolero Daimi 2, C. Cerón & Hurtado 3922 (MO); pozo petrolero AMO II de Conoco, F. Coello 19 (MO); Yasuní National Park, Pontificia Universidad Católica del Ecuador Scientific Research Station by Tiputini River, along Perú trail, C. Persson 554 (MO); Estación Científica Yasuní, Río Tiputini, al SO de la confluencia con el Río Tivacuno, 6 km al E de la carretera Maxus, Km 44, desvío hacia el pozo Tivacuno, K. Romoleroux & Pitman 2326 (MO). **Sucumbíos:** Finca Cielito Lindo, X. Cornejo 7552 (GUAY, MO).

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